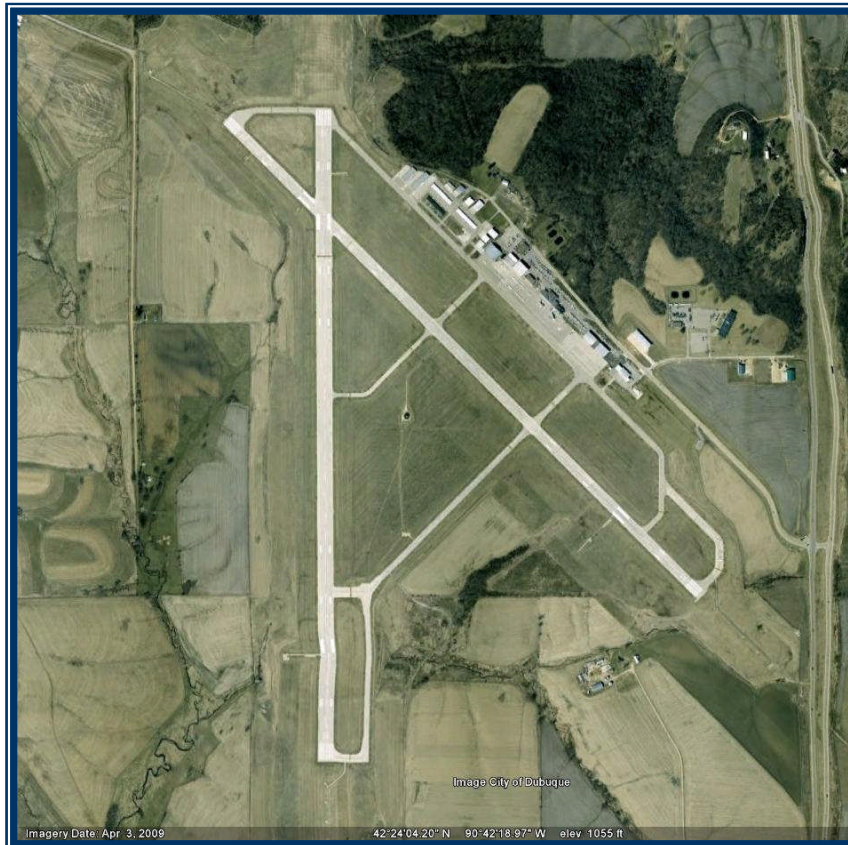


Dubuque Regional Airport (DBQ)



Safety Management System Project Report

November 2 -3, 2011

Dubuque Regional Airport (DBQ)

- DBQ Participation in FAA Pilot Studies
- Project Tasks
- Challenges and Lessons Learned
- SMS Roadmap

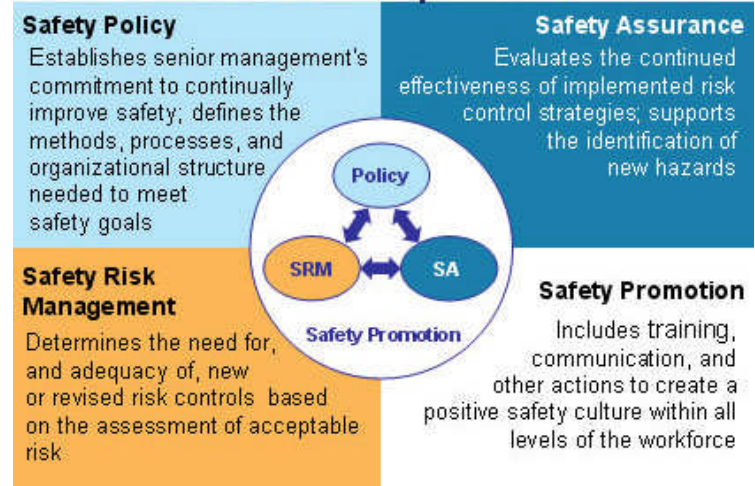


Dubuque Regional Airport (DBQ)

- **FAA Pilot Study I April 2007- June 2008**
 - Gap Analysis, SMS Manual and Implementation Plan

- **FAA Pilot Study III September 2010 - November 2011**
 - Safety Risk Management Implementation
 - Three Safety Risk Assessments
 - Implement a Safety Reporting & Data Collection System
 - Collection of Safety Data
 - Trend Analysis
 - Internal Program Evaluation
 - Other
 - ★ Review of SMS Manual
 - ★ Data Analysis Reports
 - ★ Final report

The Four SMS Components



Dubuque Regional Airport (DBQ) Background

- Owned by the City of Dubuque
 - Airport's site is about 1,100 acres with 2- runways
- Class IV, mostly for general aviation operations
- Services include maintenance, refueling and hangars
- University of Dubuque has a flight school
- Safety – DBQ has been recognized by FAA a number of times for its strong safety commitment.
- DBQ won the FAA's "Airport Safety Enhancement Award in 1994, 1997, 2000, 2003.
- DBQ Airport marked 17 consecutive years of perfect safety inspections for Part 139. That record is unmatched among the approximate 600 certified U.S airports



DBQ Study Tasks



Task 1 - Safety Risk Management Implementation

- Reviewed, assessed, and updated of SMS Manual from Pilot Phase 1, including SRM process
- SRM and SA training to SRA staff
- ARA and Cartegraph developed SRM software module
- Discussions with SMS Coordinator and DBQ staff on SRM of daily hazards identified
- Backbone of the safety reporting system is an asset management system which serves as basis for SMS module

DBQ Screen Shot

Hazard Data and SRM

Cartograph Navigator - WORKdirector - [Airport SMS Dubuque Requests]

File Edit View Forms Filters Records Actions GIS Reports Tools Window Help

WORKdirector

Work Request

Requests

Work Order

Work Orders

Resources

Worksheets

Labor

Equipment

Materials

Vendors

GIS

LIGHTview

VERSAtion

BRIDGEview

P... Con...

Work Request Information

Request: 13

Issue and Location

Issue: Equipment maintenance and condition

Standard Operating Procedure:

Location/Building: America Hangar

Incident Description: Roof leaking in south east corner up to peak

Injury Description: Roof leaking in south east corner up to peak

Witnesses:

Requestor Information

First Name: James

Last Name: Jenkins

Organization/Tenant: University of Dubuque

Position: Chief Mechanic

Phone Number: (563) 589-3812 Ext:

Mobile Number: () -

Find Citizen: Caller History Edit Citizen Clear All

Requestor Source: Web Requestor

Response to Web Requestor

Response Notes: Request has been scheduled.

Risk/Consequence Identification

Potential Consequence: Facility Damage

Expected Risk Rating After Control Measures: E4

Issue Type

(Choose all that apply)

Safety: ☐ Security: ☐ Maintenance: ☒ Other Issue: ☐

Choose Issue Cause

Damage: ☐ Equipment: ☐ Cause Factor:

Training: ☐ Weather: ☒ Other: ☒ None: ☐

Risk Assessment

Risk Rating Prior to Control Measures: E4 Risk Level: Low Risk

Risk Description: Extremely Improbable - Minor

FAA Hazard Severity Classification: Minimal damage to aircraft; Minor injury to passengers;

FAA Likelihood Levels - General: Probability of occurrence per operation is less than 1x10-9

Action Needed

Entry Date: 07/01/2011 8:43:13 AM

Assigned To:

Department: Airfield Maintenance

Activity: Inspect

Priority: Medium

Attachments

Z:\Leak in Hanger.jpg

New Save

E-mail Request

Convert Request to Work Order

Convert Request to Work Order and E-mail

Airport SMS Risk Assess...

Requests Request Number: 13 Viewing Record: 1 of 14 Total: 29 Filter Sort

DBQ Screen Shot

SMS Hazard/Incident Database

Cartograph Navigator - WORKdirector - [Airport SMS Dubuque Work Order]

File Edit View Forms Filters Records Actions GIS Reports Tools Window Help

WORKdirector

Work Request

Requests

Work Order

Work Orders

Resources

Worksheets

Labor

Equipment

Materials

Vendors

GIS

LIGHTview

VERSView

BRIDGEView

P... Con...

Work Order Information

Work Order: 05-007

Issues

Issue: Leak

Location/Building: America Hangar

Incident Description: Leaking Roof south end of roof - multiple leaks

Injury Description: None

Witnesses: None

Response Notes:

Potential Consequence:

Risk Rating Prior to Control Measures: E5 Risk Level: Low Risk

Risk Description: Extremely Improbable - No Safety Effect Risk Rating After Control Measures:

ISSUE TYPE

Safety Issue: ☐ Maintenance Issue: ☒

Security Issue: ☐ Other Issue: ☐

ISSUE CAUSE

Damage: ☐ Training: ☐ Other: ☒

Equipment: ☐ Weather: ☒ None: ☐

Issue Cause Factor:

Status

Assigned To:

Department: Airfield Maintenance

Activity: Inspect

Work Order Status: Planned

Priority:

Start Date:

Due Date:

Stop Date:

Request Entry Date: 04/18/2011 10:43:39

Repeat Interval:

Notes:

Entered By: tdalsing

Attachments

Go To Work Order

Associated Requests

Resource Entry

Close Work Order

Planned Work Orders

Completed Work Orders

New Work Order

Save Work Order

Labor	Material	Contractors	Associated Equipment Events	Associated Asset Events				
ID	Activity	Cost	Standard Hours	Overtime 1 Hours	Start Date	Stop Date	Total Hours	Notes

Work Orders | Work Order Number: 05-007 | Viewing | Record: 1 of 6 | Total: 24 | Filter | Sort



DBQ Screen Shot

Risk Assessment

Cartograph Navigator - WORKdirector - [Risk Assessment]

File Edit View Forms Filters Records Actions GIS Reports Tools Window Help

WORKdirector

Work Request

Requests

Work Order

Work Orders

Resources

Worksheets

Labor

Equipment

Materials

Vendors

GIS

LIGHTview

VERSAview

BRIDGEview

P... Con...

Risk Assessment

RISK MATRIX		SEVERITY				
		No Safety Effect	Minor	Major	Hazardous	Catastrophic
		5	4	3	2	1
LIKELIHOOD	Frequent A					
	Probable B					
	Remote C					
	Extremely Remote D					
	Extremely Improbable E					
		High Risk Medium Risk Low Risk				

FAA Severity Definitions

Hazard Severity Classification				
Minimal	Minor	Major	Hazardous	Catastrophic
5	4	3	2	1
- No damage to aircraft but minimal injury or discomfort of little consequence to passenger(s) or workers	- Minimal damage to aircraft; - Minor injury to passengers; - Minimal unplanned airport operations limitations (i.e. taxiway closure); - Minor incident involving the use of airport emergency procedures	- Major damage to aircraft and/or minor injury to passenger(s)/worker(s); - Major unplanned disruption to airport operations; - Serious incident; - Deduction on the airport's ability to deal with adverse conditions	- Severe damage to aircraft and/or serious injury to passenger(s)/worker(s); - Complete unplanned airport closure; - Major unplanned operations limitations (i.e. runway closure); - Major airport damage to equipment and facilities	- Complete loss of aircraft and/or facilities or fatal injury in passenger(s)/worker(s); - Complete unplanned airport closure and destruction of critical facilities; - Airport facilities and equipment destroyed

FAA Likelihood Levels

	General	Airport Specific
Frequent A	Probability of occurrence per operation is equal to or greater than 1x10-3	- Major damage to aircraft and/or minor injury to passenger(s)/ worker(s);
Probable B	Probability of occurrence per operation is less than 1x10-3, but equal to or greater than 1x10-5	Expected to occur about once every month or 250,000 departures (4x10-6), whichever occurs sooner
Remote C	Probability of occurrence per operation is less than 1x10-5 but equal to or greater than 1x10-7	Expected to occur about once every year or 2.5 million departures (4x10-7), whichever occurs sooner
Extremely	Probability of occurrence per operation is less than 1x10-7	Expected to occur once every 10-100 years

Airport SMS... Risk Assess...

Requests Request Number: 13 Viewing Record: 1 of 14 Total: 29 Filter Sort



DBQ Study Tasks

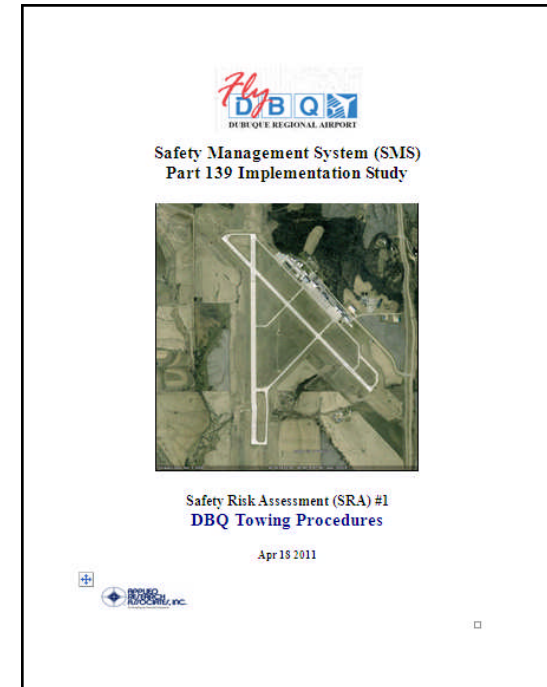
Task 2 - DFW Safety Risk Assessments

■ Topics

- AOA Driver Training Program
- Aircraft Towing Operations
- Construction Safety (New terminal, ramp, taxiways, service road)

■ Results

- Identification of key hazards, associated risk ratings, mitigation strategies, and post-mitigation risk ratings from SRM brainstorming sessions
- Identified risk mitigation actions
- Recommendations to further mitigate low risks



Lessons Learned

- The combination of key stakeholders and SMEs is essential to success
- General topics (e.g. Construction) are more difficult to realize consequential results
 - Need to stretch to identify specific hazard areas
 - Plan for extended time periods
 - Takes more in depth time and assessment than stakeholders anticipate
- Facilitation is key to maintain focus
- Brief of SRM topic and process before the start of the session
- SRM meetings helped view job tasks in different sense
 - Have key stakeholders who do the job attend brainstorming session
 - Maintain focus on areas specific to the SRM topic
 - Maintain control of FHA / brainstorming sessions
 - It is recommended to have a preliminary list of hazards identified for the brainstorming session specific to the topic

Activity	Hazards	Risk	Risk Level	Control Actions
Construction Safety Plan	Lack of protective equipment	Injuries to persons	H	<ul style="list-style-type: none"> Ensure the SOPs are updated and personnel receive safety briefings before entering work areas for safety gear
	Failure to conduct frequent safety inspections of work sites	FOD	M	<ul style="list-style-type: none"> Ensure FOD plan is in place Ensure Part 139 logs contain construction safety inspection reports Ensure Construction Manager reports and site inspections are reported and logs submitted
	Airport Power Outage	Injuries to persons; damage to aircraft, equipment and facilities	M	<ul style="list-style-type: none"> Promote awareness Promote awareness, SOP Ensure back up procedures are in place in case of a blackout
	Lack of FOD control Plan in place	FOD	M	<ul style="list-style-type: none"> Training Ensure FOD Plan in Safety Plan Ensure FOD Plan in SOPs
	Lack of a Traffic Control Plan with "taggers" in place	Equipment and construction vehicle collisions with aircraft or other vehicles	L	<ul style="list-style-type: none"> Ensure traffic control plan contained in Safety Plan Ensure traffic control SOPs in place
	Lack of FAA Form 7460 approved for cranes/ booms that could be obstructions	Aircraft collision	M	<ul style="list-style-type: none"> Ensure all Forms 7460 are submitted and approved by FAA for each project element Ensure Form 7460 airspace approvals are on file for each work area and contains crane/boom approval height
	Lack of reporting unsafe conditions	Aircraft collision	M	<ul style="list-style-type: none"> Training and recurrent training Ensure regular safety briefings each shift and reporting processes are reviewed
	Lack of pre-construction meetings	Aircraft collision	M	<ul style="list-style-type: none"> Training and recurrent training SOPs Ensure pre-construction meetings are recorded and attendance logged
	Lack of contact for key safety people	Aircraft collision	M	<ul style="list-style-type: none"> Ensure all emergency contact numbers are contained in several places, e.g. -Airport Operations Center and Construction Manager, Airport Operations, Shift CM's
	Lack of contact for	Delay in emergency	M	<ul style="list-style-type: none"> Ensure all emergency contact numbers are contained in several places, e.g. -

DBQ Study Tasks

■ Task 3 - Safety Reporting and Data Collection for DBQ

OLD:

Methodology for incident or hazard reporting:

- ✦ Events recorded in text / paper and in Word-type database
- ✦ Documentation and distribution of incident report forms in Word documents stored in multiple locations
- ✦ Cumbersome and labor intensive and possibly inconsistent Inefficient and No holistic ability to collect, analyze, conduct trending of incidents and hazards
- ✦ A reactive process reporting



DBQ Study Tasks

- Safety Reporting and Data Collection for DBQ

NEW :

Enhancements supporting SMS

- ★ Automated incident reporting and hazard identification
- ★ Virtually Paperless
- ★ Consistent format which allows for archiving and permanent record keeping
- ★ Created work efficiencies / operational effectiveness
- ★ Creation of incident and hazard “central data repository” to effectively collect, analyze, and manage incidents and hazards of entire airport
- ★ Proactive response capability to mitigate hazards



Other Enhancements

- Your Gov SMS Safety Reporting System Enhancements – Went live February 16, 2011 for DBQ staff use
 - Underwent final testing with user groups June 6, 2011
 - Went live on June 16, 2011 for public use (Anonymous reporting capability in next software upgrade)
 - SMS Hazard recording and management
 - Enhanced event reporting fields
 - Alert event information captured in fields
 - Enhanced Part 139 discrepancy, incident and asset management reporting fields
 - Airfield personnel have Smart Phones with capability for reporting, sending pictures and GIS location



DBQ

Fly DBQ Web -Page

The screenshot shows the Fly DBQ website with a dark blue background. At the top is a navigation bar with links: Airline Services, Flight Status, Parking, Rental Cars, FlyDBQ Rewards Program, Maps, Visiting Dubuque, General Aviation & FBO, and About Us. Below this is the Fly DBQ logo and a secondary navigation bar with links: FlyDBQ Rewards Status, Please login, Account Details, Local Weather, and FAQs. The main banner features four images with labels: 'dbq airline services' (airplane), 'parking at dbq' (parking lot), 'visiting dubuque' (cityscape), and 'general aviation' (airplane on tarmac). Below the banner, the 'Fly DBQ and fly with ease' section describes the airport's amenities. The 'FlyDBQ Rewards Program' section explains the benefits. The 'Departures' and 'Arrivals' tables provide flight information. A 'Click here to purchase tickets' button is also present. The 'Latest News' section mentions an 'Airport Commission Meeting'. Social media links for Facebook and Twitter are at the bottom.

Navigation Bar: Airline Services | Flight Status | Parking | Rental Cars | FlyDBQ Rewards Program | Maps | Visiting Dubuque | General Aviation & FBO | About Us

Secondary Navigation Bar: FlyDBQ Rewards Status: [Please login](#) | [Account Details](#) | [Local Weather](#) | [FAQs](#)

Main Banner Images:

- dbq airline services
- parking at dbq
- visiting dubuque
- general aviation

Fly DBQ and fly with ease

These days, flying has never been easier. Dubuque Airport has everything you need for a satisfying and easy trip. When flying out of DBQ, travelers already enjoy the perks and amenities, such as free wireless internet, short security lines and a restaurant onsite.

FlyDBQ Rewards Program

It's simple really, the more you travel out of Dubuque, the higher your savings will be. After set numbers of trips through DBQ, you will receive an envelope full of coupons and discounts for local area [Rewards Program Partners](#).

[FlyDBQ Rewards Program](#)

Departures

Flight#	To	Sched Dep
AA5019	Chicago, IL	6:00 AM
AA5045	Chicago, IL	10:05 AM
AA4086	Chicago, IL	2:05 PM
AA4226	Chicago, IL	4:55 PM

Arrivals

Flight#	From	Sched Arr
AA5045	Chicago, IL	9:35 AM
AA4082	Chicago, IL	1:35 PM
AA4045	Chicago, IL	4:25 PM
AA5027	Chicago, IL	10:10 PM

[Click here to purchase tickets](#)

Latest News

Airport Commission Meeting

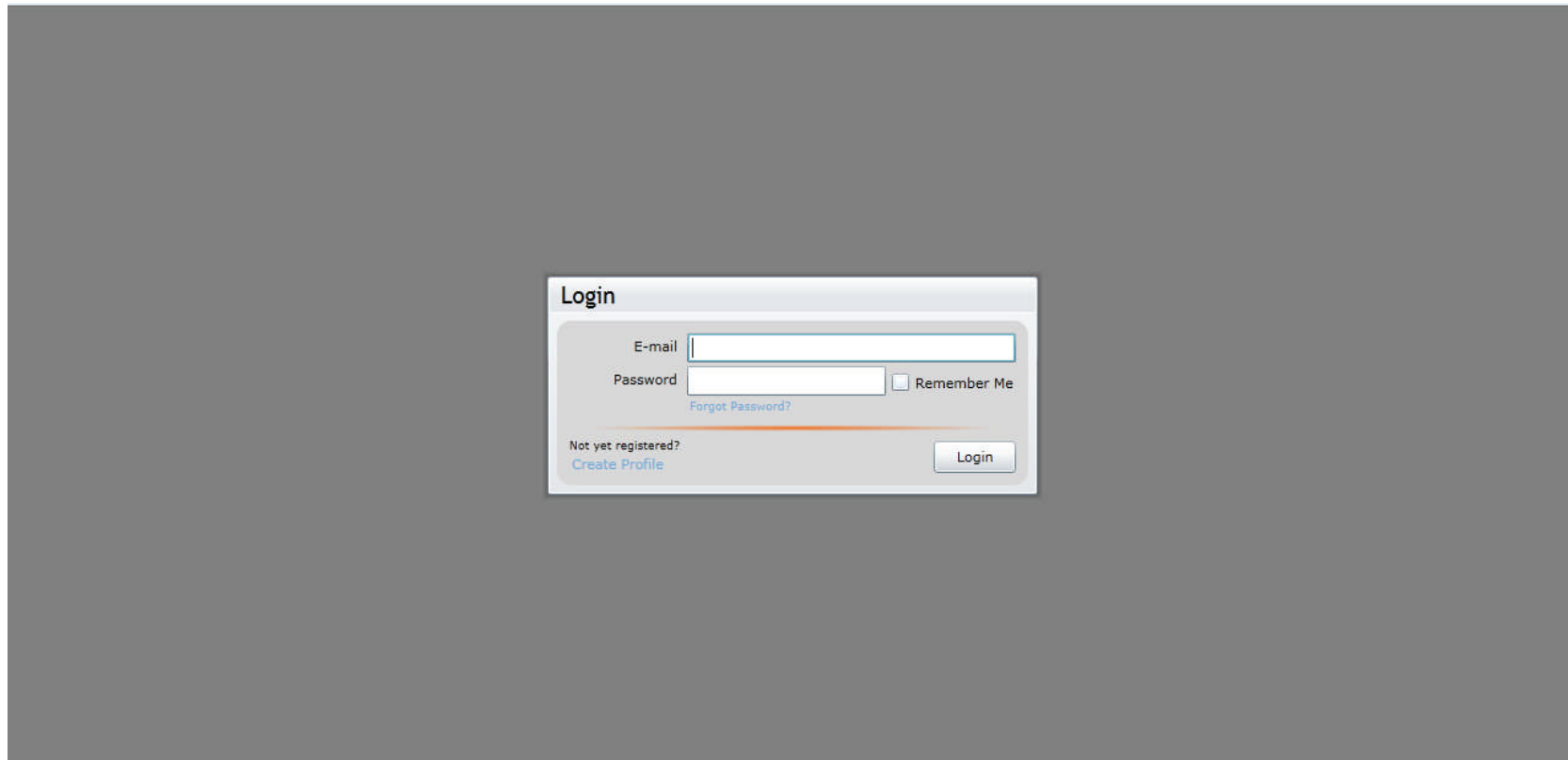
[Learn More >>](#)

[Click here to report Airport Safety & Maintenance Requests](#)

[Facebook](#) [Twitter](#)

DBQ

Fly DBQ SMS Login Page

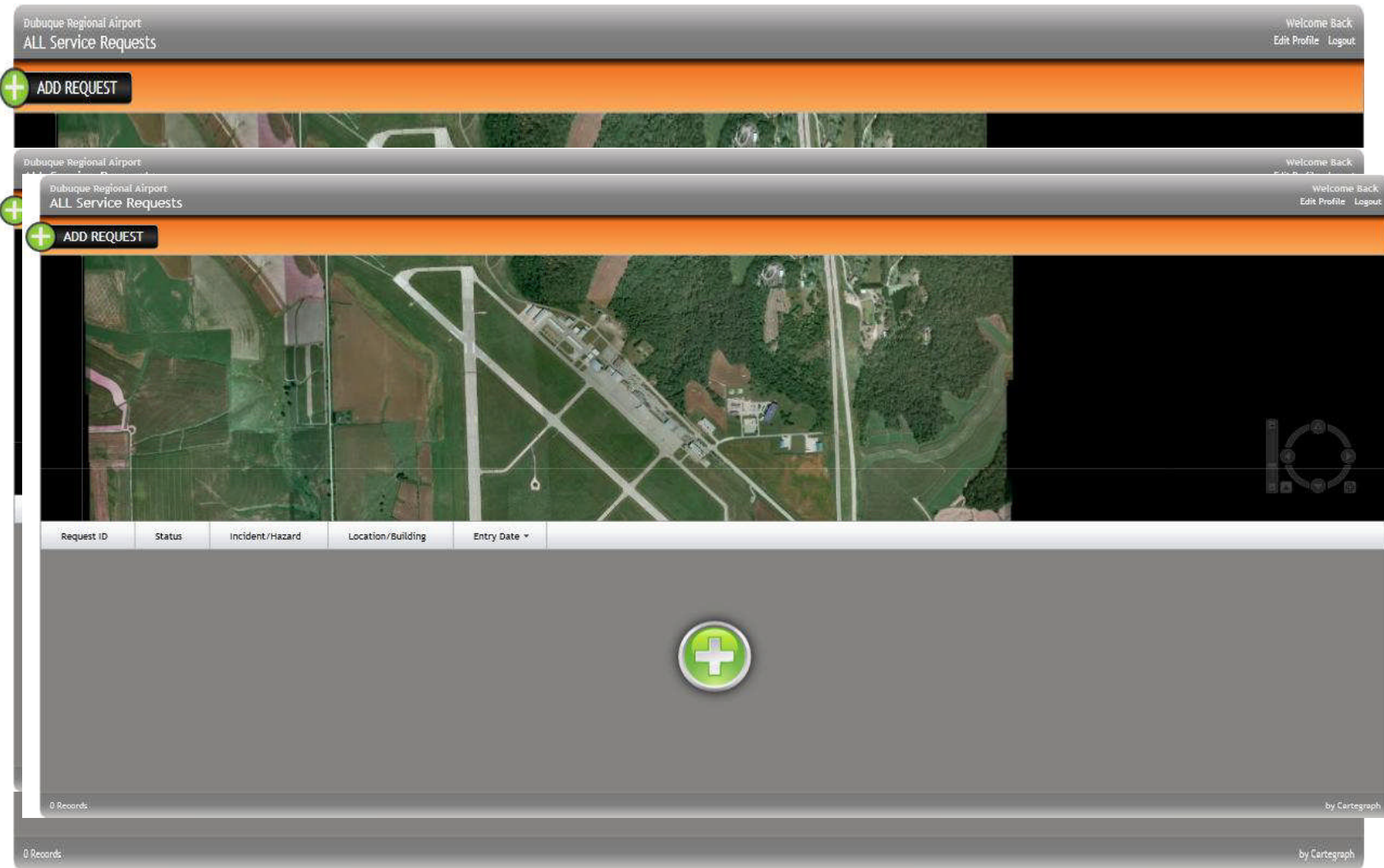


The screenshot shows a login interface on a grey background. The login box is titled "Login" and contains the following elements:

- E-mail:
- Password: ☐ Remember Me
- [Forgot Password?](#)
- Not yet registered? [Create Profile](#)
-

DBQ

Add Request Page





DBQ

Issue Data Page

Dubuque Regional Airport
ALL Service Requests

Welcome Back
[Edit Profile](#) [Logout](#)

 **ADD REQUEST**



Request ID Status Incident/Hazard Location/Building Entry Date ▾

0 Records

by Cartegraph

DBQ


Review Issue Page

Dubuque Regional Airport
ALL Service Requests

Welcome Back
Edit Profile Logout

+

ADD REQUEST



Request ID	Status	Incident/Hazard	Location/Building	Entry Date
23	Planned	FOD (Foreign Object Debris)	T-Hanger Gate	7/29/2011 1:41:42 PM
Activity: Inspect		Description of Incident/Hazard: There is a barrel in front of the hanger that needs to be removed.		
Close date:		Description of Injury/Damage: No Injury or Damage		
		Response Notes:		

1 Records

by Cartegraph

DBQ Study Tasks

■ Tasks 4 and 5 - Data Collection and Analysis

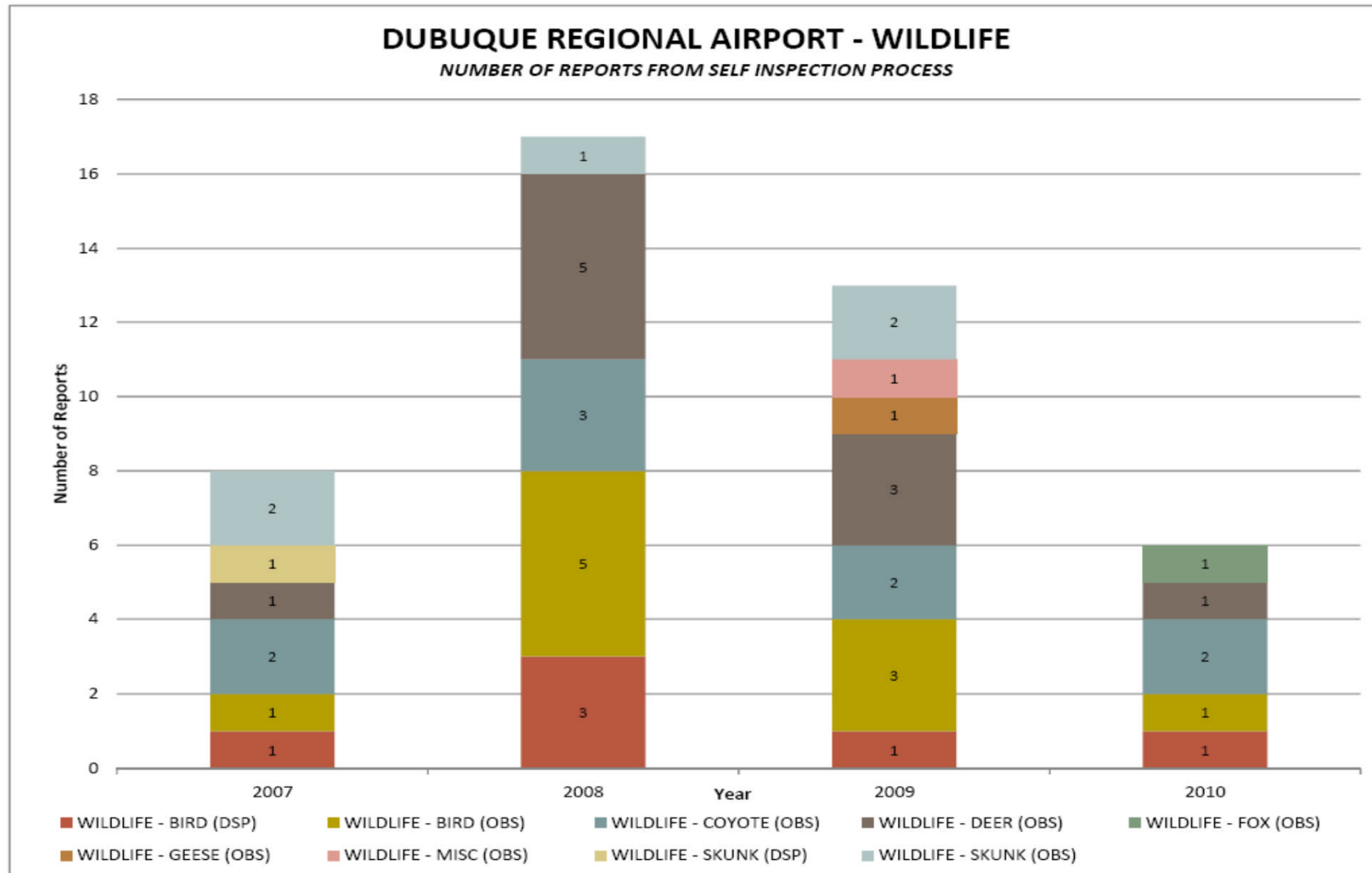
■ Data Sources

- National Transportation Safety Board (NTSB) – from 1970
- NASA /FAA Aviation Safety Reporting System (ASRS) – from 1988
- FAA Accident/Incident Data System (AIDS) – from 1982
- DBQ AOA Movement Area Incidents – 2000 to 2010
- DBQ AOA Non-Movement Area Incidents – 2000 to 2010
- Daily Airfield Safety Inspection Record , inspections 2005 to 2010
- FAA Wildlife Strike Database – from 1991

■ Reports

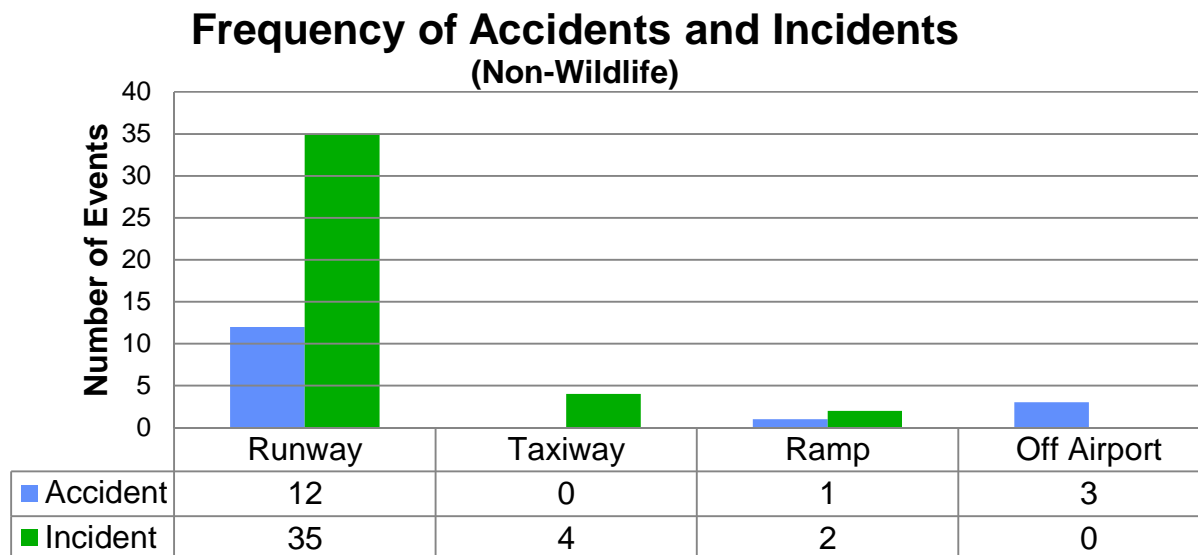
- DBQ Data Analysis Part 1
- Analysis of Daily Airfield Safety Inspection Records (DASIR)

DBQ data Collection and Analysis



DBQ Data Collection and Analysis

- **Summary of Accidents and Incidents at DBQ**
- **Databases:**
- National Transportation Safety Board (NTSB) - from 1970
- FAA Accident/Incident Data System (AIDS) – from 1982
- FAA/NASA Aviation Safety Reporting System (ASRS) – from 1988
- FAA Wildlife Strike – from 1991
- Summary of Accidents and Incidents



DBQ – Study Tasks

■ Task 6 - Internal Program Evaluation

■ Process

- Conducted from July 11-13
- 6 stakeholders interviewed
- Addressed SRM and SA
- Used methodology described in ACRP Report 1, Vol 2

■ Conclusions

- Staff awareness of SMS and SRM was evident with positive attitude
- DBQ departments managed by SMS Coordinator who is Supervisor of OPS / Maint responsible for integrating SMS into processes
- SMS Coordinator has highly visible SMS program in OPS/ Maint.
- Cartegraph – Your Gov is a pronounced software solution for SMS with countless benefits
- Safety data is being reported, analyzed, trended and investigated
- Signs of positive safety culture already in change

Internal Program Evaluation/ Audit

- Opportunities for Improvements
 - Implementation of all SMS processes documented in DBQ SMS manual
 - Integrate current safety programs into SMS
- Forward Plan
 - Approve SMS Manual
 - Implement Safety Promotion
 - Integrate other Stakeholders to SMS
 - Integrate ramp activities to SMS
 - Implement SMS indoctrination training (preferably on-line)
 - Train all DBQ staff on SMS and safety reporting; reach out to stakeholders to implement SMS training



Safety Management System (SMS) Manual Volume 1

Version 1.0
1 Feb 2011



Expanding the Realm of Possibility

Safety Risk Management and Safety Assurance Training

- Presentation for SMS Indoctrination and Safety Reporting (actual training will be provided by DBQ)
- SMS, SRM and SA Executive Overview (July/2011)

Dubuque Regional Airport Findings

- DBQ SMS Part 139 Implementation Study was successfully completed as of August 31, 2011. All six (6) tasks were accomplished with beneficial results.
 - ✦ Key “ Findings” of the DBQ SMS Implementation Study are:
 - Dubuque SMS structure includes the processes, procedures and policies covering elements and components of SMS
 - Existence of a comprehensive safety policy
 - Continual safety improvement environment
 - Employees are encouraged to report safety issues without fear of reprisal
 - DBQ provides the necessary resources- financial, equipment, personnel, etc.

Challenges & Lessons Learned

- DBQ Airport SMS Implementation Study applied **Best Management Practices** –BMPs for Lessons Learned:
 - ✦ Work closely with airport to define their vision for a holistic SMS
 - ✦ Begin early on in the project in coordinating the SMS portal development, schematic framework and software solution
 - ✦ If the SMS portal system will interface with other systems ,e.g. city web-site explore potential issues well in advance for resolution steps
 - ✦ Limit the time and attendance at SRA sessions so as not to lose focus
 - ✦ Review data collection retrieval processes, coordination and practices , in particular proprietary information confidentiality



Challenges & Lessons Learned

- Challenges associated with DBQ SMS project:
 - ✦ Interface of the SMS portal web –based system with a new DBQ Airport stand-alone Airport web-site
 - ✦ The Airport web site being interfaced with the City of Dubuque web-site
 - ✦ Limited data historical records available

Successes

- Successes of DBQ SMS Implementation Study:
 - ✦ Accomplished implementation of a SMS safety reporting portal that allows future anonymous hazard reporting via the airport's web-page
 - ✦ SMS portal interface can populate the SMS work sheets from safety hazard report data
 - ✦ SMS portal interface with asset management system with capability to populate and issue a work order to the maintenance department
 - ✦ Implementation of findings and recommendations resulting from safety risk assessments

Dubuque Regional Airport

“What Will Help Other Airports”

- What May Help Other Airports:
 - ✦ If Gap Analysis previously conducted , recommend an abbreviated Gap Analysis to assess “current airport” operating conditions
 - ✦ Recommend the “Audit” be conducted as an “Assessment” to assess the current state of the airport’s procedures and policies in relationship to the SMS Manual
 - ✦ Develop Airport’s SMS Manual early on, conduct periodic reviews that may trigger updates during steps of SMS Implementation process